



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/706,626	11/12/2003	Shinichi Takahashi	0941.68725	7983

7590 01/25/2008  
Patrick G. Burns, Esq.  
GREER, BURNS & CRAIN, LTD.  
Suite 2500  
300 South Wacker Dr.  
Chicago, IL 60606

EXAMINER
----------

KAYRISH, MATTHEW

ART UNIT	PAPER NUMBER
----------	--------------

2627

MAIL DATE	DELIVERY MODE
-----------	---------------

01/25/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/706,626

Applicant(s)

TAKAHASHI, SHINICHI

Examiner

Matthew G. Kayrish

Art Unit

2627

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 26 October 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/26/2007 has been entered.

### ***Response to Arguments***

2. Applicant's arguments with respect to claim 1 have been considered but are moot in view of the new grounds of rejection.

Regarding the argument that Utsunomiya does not disclose a recessed portion within the disk-facing surface, the examiner agrees. However, Kameyama discloses a plurality of recessed portions that are designed to capture the dirt in the airflow, as stated in paragraph 48 of the specification. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide airflow grooves in the disk-facing surface of the slider of Utsunomiya, as taught by Kameyama, because dust or dirt can be prevented from accumulating, as stated in paragraph 48.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

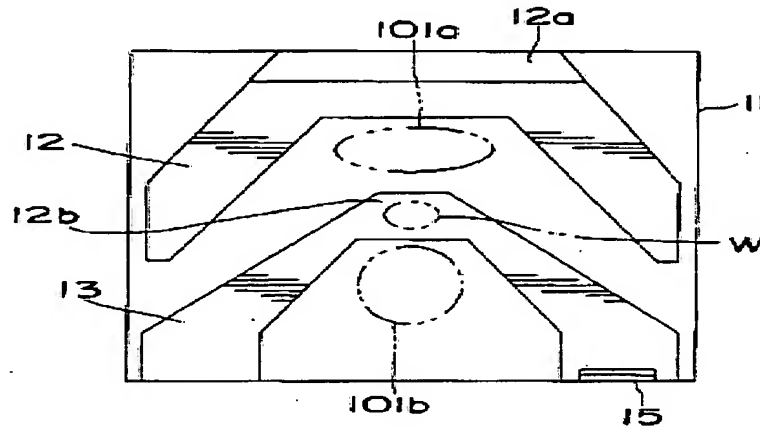
4. Claims 1-6 and 11-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Utsunomiya (US Patent Number 6072662), in view of Kameyama (US PG-Pub 2003/0011934).

Regarding claims 1 and 11, Utsunomiya discloses:

A head slider for a magnetic disk lifted above the magnetic disk by airflow generated by rotation of the magnetic disk, said head slider comprising:

A disk-facing surface (figure 7, between items 12 & 13) having an air bearing surface/front rail (figure 7, items 12 & 13) raised from said disk-facing surface (figure 6b, items 12 & 13 are raised from item 12a) and a portion recessed within said disk-facing surface (figure 7, item 101a) and located behind said air bearing surface/front rail when viewed in a direction of the airflow (figure 7, item 101a is behind a portion of disk-facing surface);

An airflow guide part guiding the airflow along the disk-facing surface of said head slider toward sides of the disk-facing surface (column 5, lines 22-44; figure 7 below);



Utsunomiya fails to specifically disclose:

An airflow guide part located in said portion recessed within said disk-facing surface;

Wherein the airflow guide part includes a first guide groove formed between both sides of the disk-facing surface.

Kameyama discloses:

A head slider for a magnetic disk lifted above the magnetic disk by airflow generated by rotation of the magnetic disk (abstract, paragraph 45), said head slider comprising:

A disk-facing surface (figure 5, item 76) having an air bearing surface (figure 5, item 50 & 52) raised from said disk-facing surface (figure 5) and a portion recessed

within said disk-facing surface (figure 5, item 78) and located behind said air bearing surface when viewed in a direction of the airflow (figure 5);

An airflow guide part (figure 5, item 78) located in said portion recessed within said disk-facing surface (figure 5);

Wherein the airflow guide part includes a first guide groove formed between both sides of the disk-facing surface (figure 5, item 78 is between the right and left edges of item 76).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide airflow grooves in the disk-facing surface of the slider of Utsunomiya, as taught by Kameyama, because dust or dirt can be prevented from accumulating, as stated in paragraph 48.

Regarding claims 2, 5, 12 and 15, Utsunomiya and Kameyama disclose the features of base claims 1, 4, 11 and 14, as stated in the 103 rejection above, and further disclosing:

Wherein the airflow guide part is formed to extend in directions each inclined at an angle with respect to a flow direction of the airflow (figure 7 above).

Regarding claims 3 and 13, Utsunomiya and Kameyama disclose the features of base claims 1 and 11, as stated in the 103 rejection above, and further disclosing:

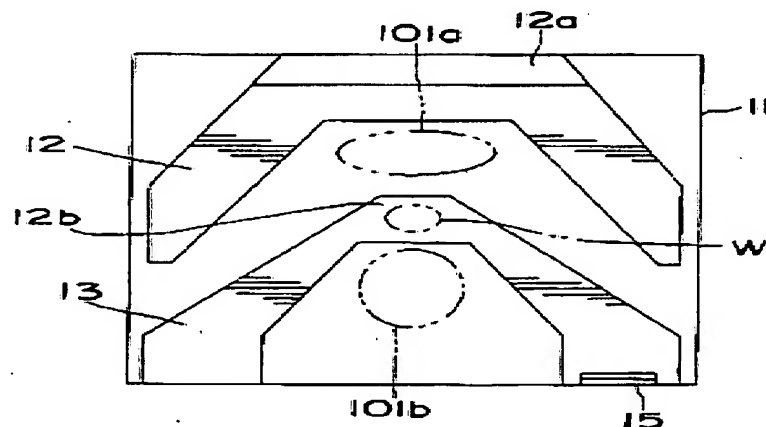
Wherein the airflow guide part (figure 7, item 101a) includes a capturing part that captures dust included in the airflow (columns 5 & 8, lines 52-58 & 38-42, implies that dust gets trapped in negative pressure regions).

Regarding claims 4 and 14, Utsunomiya and Kameyama disclose the features of base claims 1 and 11, as stated in the 103 rejection above, and further disclosing:

Wherein the airflow guide part comprises:

A first guide part formed to extend from the vicinity of the center of the disk-facing surface to both sides of the disk-facing surface (figure 7 below); and

A pair of second guide parts formed on opposing side surfaces of said head slider and continuing with said first guide part (figure 7 below).



Regarding claims 6 and 16, Utsunomiya and Kameyama disclose the features of base claims 4 and 14, as stated in the 103 rejection above, and further disclosing:

Wherein one of the first and second guide parts includes a capturing part that captures dust included in the airflow (figure 7, item 101a is within the first and second guide parts).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 7-10 and 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Utsunomiya and Kameyama, as applied to claims 1 and 11 above, and further in view of Nakano (US Patent Number 6801399).

Regarding claims 7 and 17, Utsunomiya and Kameyama disclose the features of base claims 1 and 11, as stated in the 103 rejection above, and further disclosing:

Wherein the airflow guide part comprises:

A first guide groove formed to extend from the vicinity of the center of the disk-facing surface toward both sides of the disk-facing surface (figure 7, inclined first and second guide parts make the guide groove); and

Utsunomiya fails to specifically disclose:



A pair of second guide grooves formed on opposing side surfaces of said head slider and communicating with said first guide groove.

Nakano discloses:

A head slider for a magnetic disk lifted above the magnetic disk by airflow generated by rotation of the magnetic disk (abstract), said head slider comprising:

A disk-facing surface (figure 15, items 20a, 20c, 8g, 8h, 8i and 8j) having an air bearing surface (figure 15, item 7a & 7d) raised from said disk-facing surface (figure 16d) and a portion recessed within said disk-facing surface (figure 15, item 6) and located behind said air bearing surface when viewed in a direction of the airflow (figure 15, item 6 extends behind disk-facing surface);

A pair of second guide grooves formed on opposing side surfaces of said head slider (figure 15, item 10c & 10d) and communicating with said first guide groove (figure 15, items 10c & 10d are in connection with the rear out flow area [6]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide Utsunomiya with second grooves that are in communication with the first grooves, as taught by Nakano, because this will add another negative pressure region, which will help the head slide to stay in contact with the disk surface.

Regarding claims 8 and 18, Utsunomiya, Kameyama and Nakano disclose the features of base claims 7 and 17, as stated in the 103 rejection above, but Utsunomiya fails to specifically disclose:

Wherein one of the first and second guide grooves includes a capturing groove that captures dust included in the airflow, and the capturing groove is formed deeper than the first and second guide grooves.

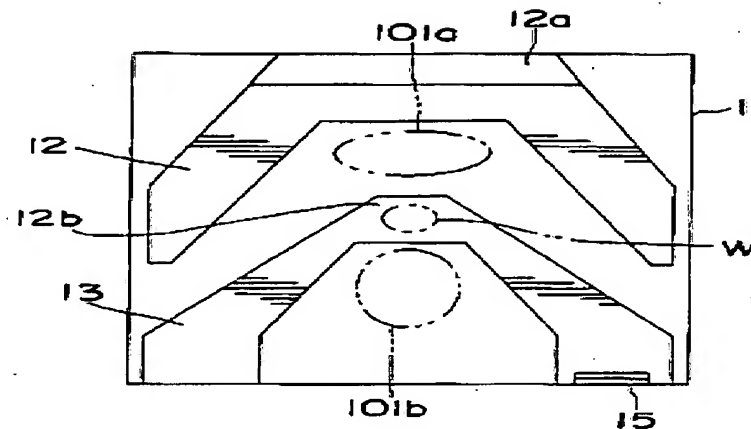
Kameyama discloses:

Wherein one of the first and second guide grooves includes a capturing groove that captures dust included in the airflow, and the capturing groove is formed deeper than the first and second guide grooves (paragraph 48).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include recesses portions which are formed deeper into the head slider than the guide grooves of Utsunomiya, as taught by Kameyama, because this will to capture dirt and debris as stated in paragraph 48.

Regarding claims 9 and 19, Utsunomiya, Kameyama and Nakano disclose the features of base claims 7 and 17, as stated in the 103 rejection above, and further disclosing:

Wherein, in the first guide groove, an inflow-side wall along which the airflow flowing along the disk-facing surface enters the first guide groove is an inclined surface, and an outflow-side wall along which the airflow flowing along the disk-facing surface is discharged is a vertical surface (see figure 7 below).



Regarding claims 10 and 20, Utsunomiya, Kameyama and Nakano disclose the features of base claims 1 and 11, as stated in the 103 rejection above, and further disclosing:

Wherein the disk-facing surface includes a pair of front pads, located in front of and adjacent to said recessed portion when viewed in a direction of the airflow, and further wherein the airflow is guided between said front pads toward said airflow guide part.

Nakano discloses:

Wherein the disk-facing surface includes a pair of front pads (figure 15, items 7a & 7b), located in front of and adjacent to said recessed portion (figure 15, the center portion of the slider) when viewed in a direction of the airflow, and further wherein the airflow is guided between said front pads toward said airflow guide part (figure 15, item 2).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide Utsunomiya with an airflow-inlet, as taught by

Nakano, because the airflow inlet provides a path for air to rush past the second guide grooves. This will therefore create a negative pressure region behind the front pads. The negative pressure behind both pads will stabilize the head slider to a uniform flying height above the disk.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew G. Kayrish whose telephone number is 571-272-4220. The examiner can normally be reached on 8am - 5pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrea Wellington can be reached on 571-272-4483. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>.

Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

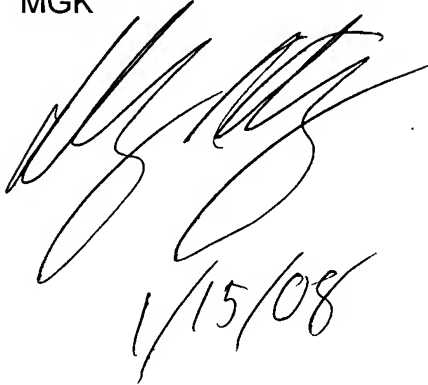
Application/Control Number:  
10/706,626  
Art Unit: 2627

Page 12

Matthew G. Kayrish

1/15/08

MGK



1/15/08

**Brian E. Miller /Brian E. Miller/  
Primary Patent Examiner AU2627**